

## CLAIMS

1. For use with a hinge and locking assembly comprising a first support plate, a second support plate coupled to the first support plate for pivoting movement about an axis, and a knob rotatable about the axis and movable axially along the axis between a first axial position and a second axial position, the knob having a pair of stop members, a rotation limiter comprising  
a lock member coupled to the second support plate, the lock member having a pair of radial segments,  
a slip disc rotatable about the axis, the slip disc having first and second tabs, the first tab being configured for receipt between the radial segments of the lock member when the knob is moved from the first position to the second position, and the second tab being received between the stop members, and  
a spring arranged to bias the slip disc for rotation with the knob.
2. The rotation limiter of claim 1, wherein the slip disc rotates with the knob in a first direction during movement of the knob through a first angular displacement corresponding to movement of the first tab between the radial segments, and wherein the knob continues to rotate in the first direction relative to the slip disc through a second angular displacement corresponding to movement of the second tab between the stop members.
3. The rotation limiter of claim 2, wherein the first and second angular displacements are each about 35°.
4. The rotation limiter of claim 2, wherein the first direction is a clockwise direction.
5. The rotation limiter of claim 1, wherein the hinge and locking assembly comprises a drive shaft rotatable about the axis, wherein the first support plate, the second support plate and the lock member are rotatably mounted on the drive shaft, wherein the knob is mounted on the drive shaft for rotation therewith, wherein the knob includes a hub portion, and wherein the slip disc is rotatably mounted on the hub portion between the lock member and the knob.
6. The rotation limiter of claim 5, wherein the drive shaft has a non-round portion, and wherein the hub portion of the knob has a complementary

non-round bore for receiving the non-round portion of the drive shaft such that the knob is movable axially along the drive shaft between the first and second positions while transmitting the rotation of the knob to the drive shaft.

7. The rotation limiter of claim 6, wherein the non-round portion  
5 of the drive shaft and the non-round bore of the hub portion of the knob are both generally triangular in cross section.

8. The rotation limiter of claim 7, wherein the hub portion is  
generally triangle-shaped in cross section, and wherein the triangular-shaped hub  
portion has rounded corner portions to facilitate rotation of the slip disc relative to the  
10 knob.

9. The rotation limiter of claim 8, comprising a lock washer  
configured to be mounted on the hub portion of the knob, wherein the rounded corner  
portions of the knob are formed include outwardly-extending step portions, and  
wherein the slip disc and the spring are positioned on the hub portion between the  
15 lock washer and the step portions.

10. The rotation limiter of claim 1, wherein the hinge and locking  
assembly comprises a knob spring positioned between the second support plate and  
the knob for biasing the knob away from the second support plate, and wherein the  
first tab is configured for receipt between the radial segments of the lock member  
20 when the knob is moved toward the second support plate against the bias of the knob  
spring.

11. The rotation limiter of claim 1, comprising a lock washer,  
wherein the knob includes a hub portion, wherein the lock washer is configured to be  
mounted on the hub portion of the knob, wherein the hub portion is formed to include  
25 a step portion, and wherein the slip disc and the spring are rotatably mounted on the  
hub portion between the step portion and the lock washer.

12. The rotation limiter of claim 1, wherein the lock member  
includes an annular portion having a central bore, six radial segments extending  
outwardly from the annular portion and six tab-receiving spaces separating the six  
30 radial segments, and wherein the drive shaft is configured to be rotatably received in  
the central bore of the lock member.

13. The rotation limiter of claim 12, wherein one of the radial segments is formed to include a positioning tab configured for receipt in a positioning hole in the second support plate to maintain the orientation of the lock member relative to the second support plate.

5 14. The rotation limiter of claim 13, wherein each of the six tab-receiving spaces forms a  $35^\circ$  angle relative to the axis, and wherein each of the six radial segments forms a  $25^\circ$  angle relative to the axis.

15 15. The rotation limiter of claim 14, wherein the slip disc has three tabs which extend forwardly toward the support plates and one tab which extends rearwardly toward the knob, wherein the three forwardly-extending tabs are spaced about  $120^\circ$  apart relative to the axis, and wherein the forwardly and rearwardly-extending tabs are generally perpendicular to the plane of the slip disc.

16. The rotation limiter of claim 1, wherein the stop members extend forwardly from an inside wall of the knob and form about  $35^\circ$  at the axis.

15 17. The rotation limiter of claim 16, wherein the reception of the second tab between the stop members limits rotation of the knob relative to the slip disc to about  $35^\circ$ .

20 18. The rotation limiter of claim 1, wherein the hinge and locking assembly includes a detent member mounted on the drive shaft for rotation therewith and positioned on the drive shaft between the lock member and the slip disc, and wherein the detent member cooperates with the lock member to allow rotation of the drive shaft in a first direction while blocking rotation of the drive shaft in a second direction while .

25 19. The rotation limiter of claim 18, wherein the first direction is a clockwise direction, and wherein the second direction is an anticlockwise direction.

20. The rotation limiter of claim 18, wherein the first tab of the slip disc is positioned so that the detent member can rotate with the drive shaft when the knob is rotated without hindrance from the first tab.

30 21. For use with a hinge and locking assembly comprising a first support plate, a second support plate coupled to the first support plate for pivoting movement about an axis and a knob rotatable about the axis and movable axially along the axis between a first axial position and a second axial position, the second

support plate having a first tab-receiving space, the knob having a second tab-receiving space, a rotation limiter comprising a slip disc rotatable about the axis, the slip disk having a first tab and a second tab, the first tab moving into the first tab-receiving space when the knob is moved from the first position to the second position,  
5 the second tab being received in the second tab-receiving space.

22. The rotation limiter of claim 21, wherein the slip disk rotates with the knob in a first direction during movement of the knob through a first angular displacement corresponding to movement of the first tab through the first tab-receiving space, and wherein the knob continues to rotate in the first direction relative  
10 to the slip disk through a second angular displacement corresponding to movement of the second tab relative to the second tab-receiving space.

23. A hinge and locking assembly comprising  
a first hinge member,  
a second hinge member coupled to the first hinge member for pivoting  
15 movement about an axis, the second hinge member having a first tab-receiving space,  
a knob rotatable about the axis and movable axially along the axis  
between a first axial position and a second axial position, the knob having a second tab-receiving space, and  
a slip disk rotatable about the axis, the slip disk having a main portion,  
20 a first tab and a second tab, the first tab moving into the first tab-receiving space when the knob is moved from the first position to the second position, the second tab being received in the second tab-receiving space, the slip disk rotating with the knob in a first direction during movement of the knob through a first angular displacement corresponding to movement of the first tab through the first tab-receiving space, and  
25 the knob continuing to rotate in the first direction relative to the slip disk through a second angular displacement corresponding to movement of the second tab relative to the second tab-receiving space.

24. A locking hinge apparatus comprising  
first and second hinge members coupled together for rotation about an  
30 axis,  
a lock movable between a locking position in which the first and second hinge members are prevented from rotating about the axis and a releasing

position in which the first and second hinge members are permitted to rotate about the axis,

- 5 a knob rotatable about the axis and movable along the axis, the lock moving from the locking position to the releasing position in response to movement of the knob axially toward the first and second hinge members and then rotation of the knob about the axis, and

a rotation limiter configured to limit the amount that the knob is able to rotate each time the knob is moved along the axis toward the first and second hinge members.